Sept. 28, 1937. O. SHIMWELL 2,094,307

LOOM FOR WEAVING

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Fig.1

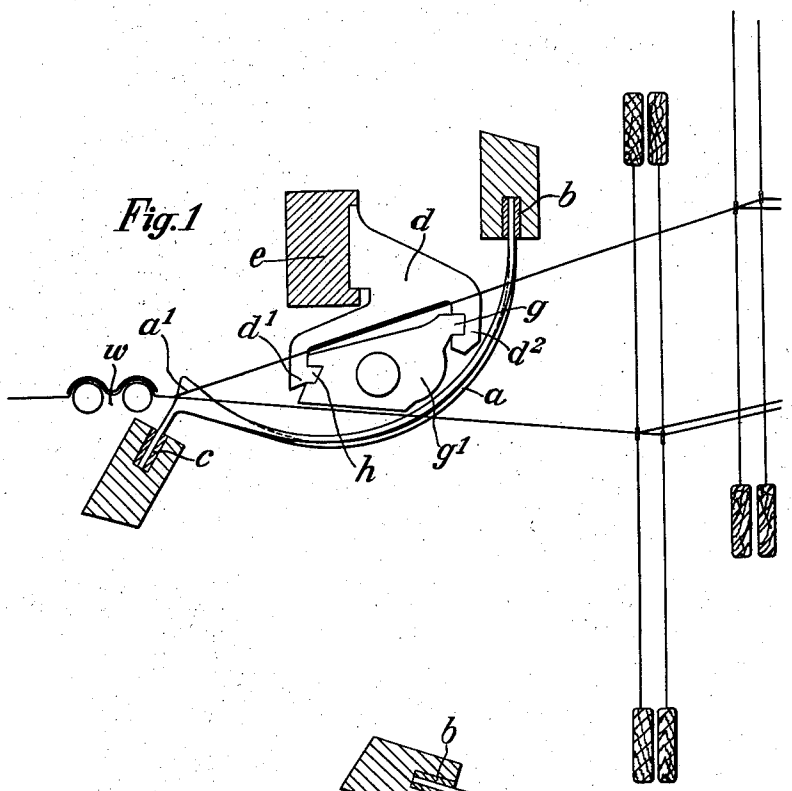
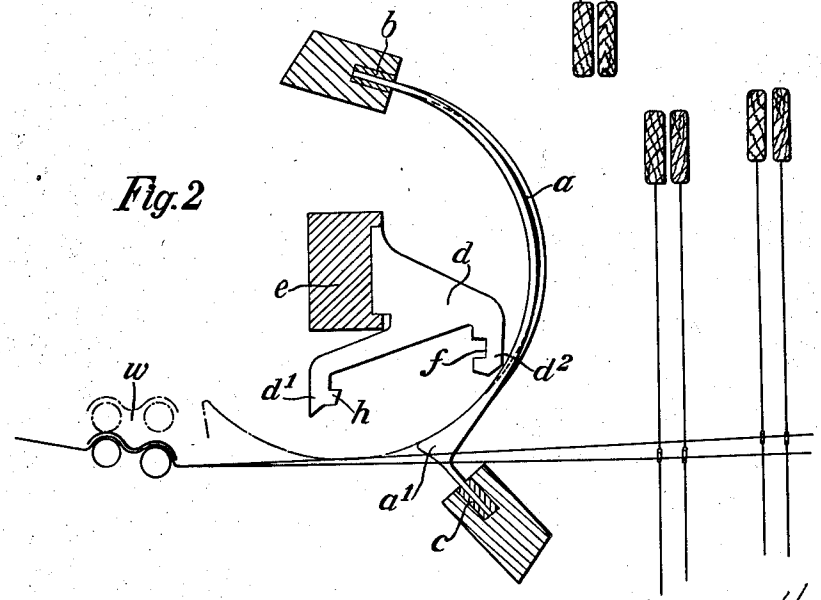


Fig.2



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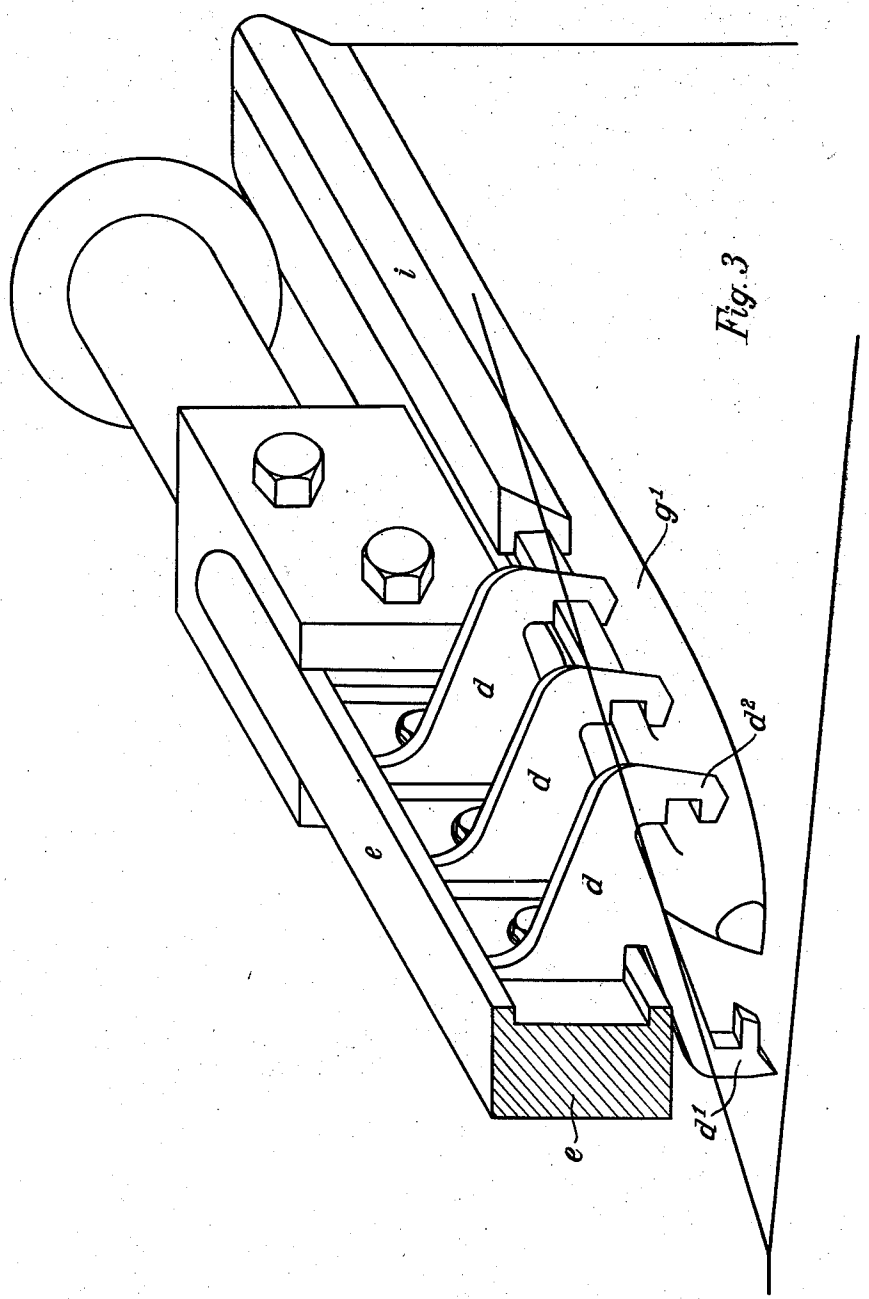


Fig. 3

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LOOM FOR WEAVING

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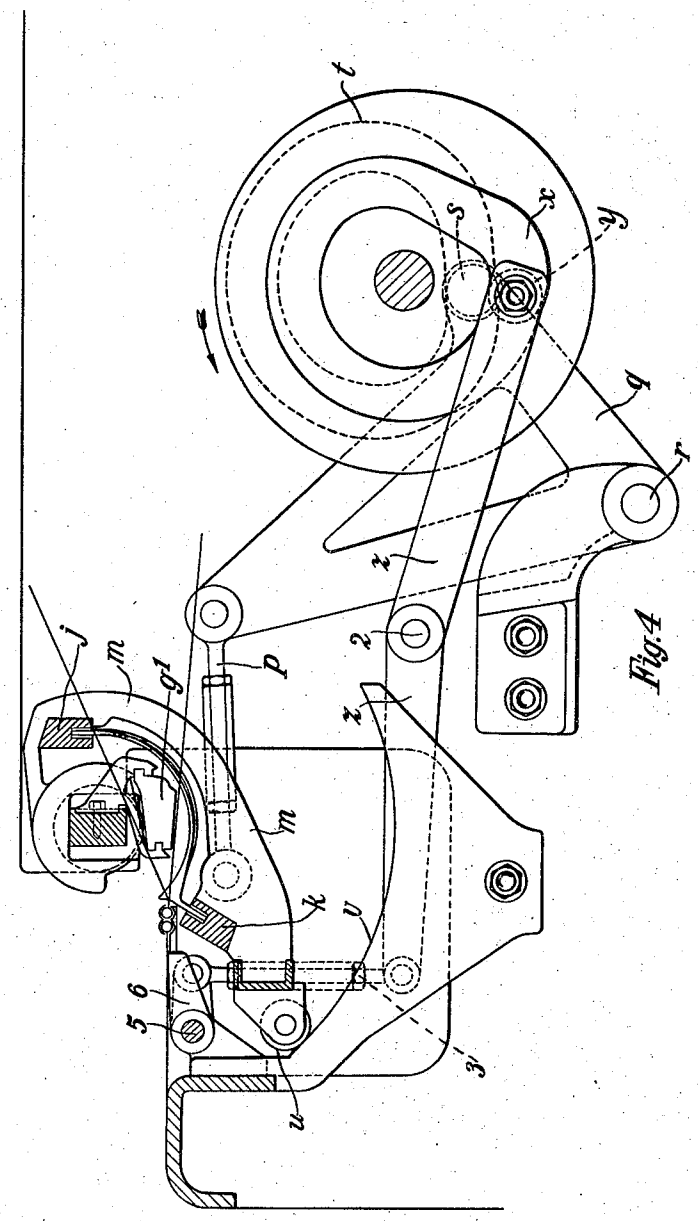


Fig.4

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LOOM FOR WEAVING

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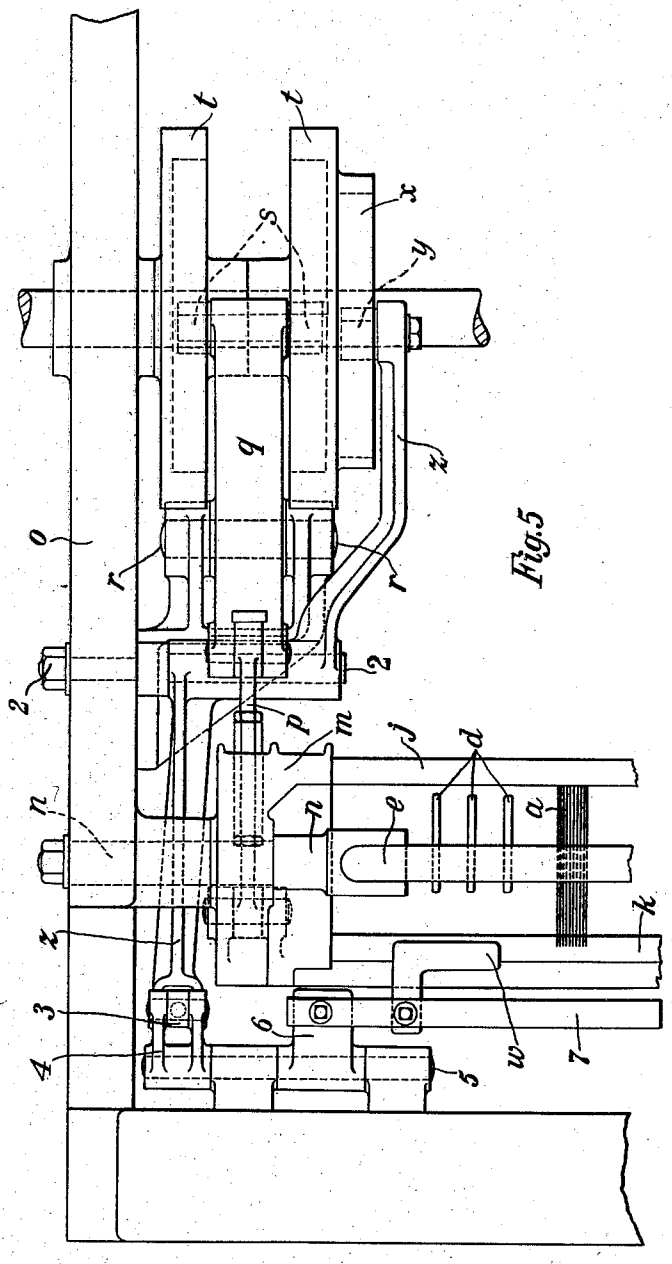


Fig.5

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Patented Sept. 28, 1937 2,094,307

UNITED STATES PATENT OFFICE

2,094,307

LOOM FOR WEAVING

Oliver Shimwell, Styles, Shiplake-on-Thames, England, assignor of one-half to Platt Brothers & Company Limited, Oldham, England, a British company

Application June 30, 1936, Serial No. 88,206
In Great Britain July 20, 1935

20 Claims. (Cl. 139—191)

This invention relates to looms for weaving and has for its object to provide for a speeding-up of the loom without the necessity for speeding-up or correspondingly speeding-up the shuttle. This is accomplished by providing a larger portion of each time cycle in the operation of the loom for the pick of the shuttle with a corresponding reduction of the portion of each time cycle spent by the shuttle in the shuttle box.

This invention comprises shaping the reed so that its lower end when beat-up is effected thereby, is in advance of the shuttle track which comes within the space between the reed and a plane passing through the upper and lower ends of the reed.

The invention further comprises a reed having a curved shape between its upper and lower ends, the lower end projecting forwardly to provide a beat up part.

The invention further comprises a reed having a curved shape between its upper and lower ends and having at its lower end a face with a forwardly projecting part to serve for beating up, the reed being mounted for pivotal movement about an axis at or adjacent to its upper end.

The invention further comprises providing a stationary shuttle track in claw like members which pass to opposite sides of the shuttle when in flight, the said track being to the rear of the lower end of the reed when beating up is taking place.

The invention further comprises the provision of means for raising the loom temples when the reed is in the beat-up position.

The invention further consists in a loom cycle comprising propelling the shuttle through a stationary track adjacent to a rearwardly curved reed, whilst the reed is moving forward to effect beating up, moving the reed by a pivotal movement substantially about its upper end backwards from the beat position whilst the shuttle is in flight, lowering the loom temples, lowering the upper row of warp threads when the shuttle flight is completed so that all the threads are in line in the lower beat-up portion of the reed, moving the reed forward and simultaneously by such movement raising the beat-up portion of the reed, raising the loom temples, re-opening the shed, and starting the shuttle on its next flight before the reed completes beating up.

Referring to the accompanying explanatory drawings:—

Figure 1 is a sectional diagrammatic view illustrating the improved reed and shuttle track arranged in one convenient form in accordance with this invention, the reed being shown in the beating up position.

Figure 2 is a view similar to Figure 1, but with the reed in its rearmost position, prior to beating up, the shuttle being omitted.

Figure 3 is a detail perspective view showing the shuttle in the shuttle box at one side of the loom, the rail carrying the shuttle race being in section.

Figure 4 is a view similar to Figure 1 but showing the means for operating the reed for beating up and the loom temple.

Figure 5 is a plan view of the parts shown in Figure 4 which are located at one side of the loom.

The reed a is shaped so that it follows a curved path between its upper and lower ends, b and c respectively, the curve extending rearwardly of said ends.

The shuttle race is provided in plates d carried by a cross rail e, such plates having a claw shaped contour to provide parts d^1, d^2 which come to the opposite sides of the shuttle in its flight. The parts d^2 are recessed at f to form a track for a projecting rib or ridge g upon the shuttle g^1 and projections h upon the parts d^1 enter a groove in the shuttle as shown in Figure 1.

The plates d which may be stampings slide into the recessed face of the rail e, with distance pieces between the several plates.

The shuttle box i, Figure 3, has recesses and projections corresponding to those on the parts d^1 and d^2 to guide and support the shuttle and to direct it correctly into the race provided by the said parts d^1 and d^2.

The rails j and k at the upper and lower ends of the reed are at their ends carried in frames as m pivoted to turn about the spindles n which are secured in the loom frame members o and which carry the cross rail e for the shuttle track. Each frame m is connected by a link p having a turnbuckle adjustment therein as shown, to a member q pivoted at r which carries bowls or rollers s running in similar cam grooves t (see Figures 4 and 5). The latter cause the oscillation of the reed between the Figure 1 and Figure 2 positions. The lower end of each frame m preferably carries a roller u riding on a track v to support the frame in its oscillatory movements.

The loom temples as shown at w in the figures are adapted to be raised and lowered. As shown in dotted lines in Figure 2, the temples are raised when the reed is in the beating-up position and lowered at other times to the full line position shown in Figure 2. This raising and lowering movement is effected by cam grooves as x (one at

each side of the loom), each of which receives a bowl or roller y upon one arm of a bell crank lever z carried by a fulcrum pin 2, the other arm of which raises and lowers a link 3 connected to arms 4 upon a spindle 5. There is an arm 6 also upon the spindle and this carries one end of a bar 7 which extends across the loom and has the loom temples w secured thereto.

It will be noted from a consideration of Figures 1 and 2 that the shuttle track projects well into the space between the reed a and a plane connecting the ends b, c of the reed and that at beating-up (see Figure 1) the shuttle track comes wholly within such space. In both figures also it will be noted that the shuttle track is close against the reed so that the opening of the shed of the warp threads 7, 8 can be to a normal extent and the fell of the cloth can be relatively close to the shuttle track.

The bottom or lower end of the reed has a forwardly and downwardly projecting part a^1 which serves to effect the actual beating-up operation. This part as will be seen by reference to Figures 1 and 2 is considerably in advance of the shuttle when beat-up occurs.

The cam tracks t which cause the backward and forward movements of the reed provide for a relatively rapid movement to effect beat-up and to withdraw the reed from the beat-up position with a long dwell whilst the shuttle finishes its flight. Thus the shuttle may be travelling through the warp threads for say 200 to 210° of the complete cam movement or cycle. The upper warp threads are lowered before the reed moves forward, so that all the warp threads lie in the forwardly projecting part a^1 of the reed as shown in Figure 2. The lower threads rise before the beat up is completed as shown in Figure 1, and the shuttle can commence to enter the shed before the reed has actually beaten up the last weft thread inserted. This also is shown in Figure 1. The forward movement of the reed may be completed in a less arc of movement from the cam than the rearward movement.

The cycle of operations of the improved loom is as follows:—The shuttle g^1 is propelled into the shed in its track in the curved or shaped part of the reed a behind the forwardly projecting part a^1 which effects beating-up. As the shuttle is flying through the shed, the reed is moved backwards from the beat-up position which causes a lowering of the beat-up portion of the reed due to the pivotal movement. The shuttle flight having been completed, the upper portion of the shed is lowered and the loom temples w also lowered, so that all the warp threads and the weft thread to be beaten-up are in the beat-up portion of the reed as shown at Figure 2. The reed now moves forward to the Figure 1 position and in doing so, the beat up portion a^1 rises; the temples w are raised simultaneously. The shed is opened before beat-up is completed and the shuttle commences its next flight before beat-up is completed.

It will be appreciated that the reed a is curved to pass around the shuttle track and has its forwardly projecting part with a dropped end to effect beating up. The raising and lowering of the loom temples w ensure the warp threads being in correct positions for beating up.

With my improvement, the shuttle boxes are stationary as the shuttle track does not move. Further, should the shuttle be trapped in any position, no damage will result.

I claim:

1. A reed for a weaving loom comprising a series of dents which have the shape of a substantially circular arc hollow side forwards with a part extending radially outwards from the arc at the lower end thereof.

2. A reed for a weaving loom comprising a series of dents rearwardly curving between their upper and lower ends and each provided with a downwardly projecting extension at its lower end.

3. A reed for a weaving loom comprising a top rail, a bottom rail, a series of dents extending in a forwardly concave curve downwards from said top rail to a point above said bottom rail and then downwards to said bottom rail.

4. A reed as claimed is claim 3 in which said top rail is provided with means for pivotally mounting said reed.

5. A reed as claimed in claim 3 in which there are end frames which receive the ends of said top rail, said end frames being provided with means forwardly spaced from said top rail for pivotally mounting said reed.

6. A reed as claimed in claim 1 comprising top and bottom rails wherein the ends of the dents are secured, end frames which receive the ends of said top rail and means on said end frames for mounting said reed for pivotal movement about a line parallel to and in front of said top rail.

7. A reed as claimed in claim 2 comprising top and bottom rails wherein the ends of the dents are secured, end frames which receive the ends of said top rail and means on said end frames for mounting said reed for pivotal movement about a line parallel to and in front of said top rail.

8. A loom comprising a shuttle track, a reed rearwardly curved in vertical section surrounding the rear portion of said shuttle track, and means for moving said reed forward along an arc of a circle around the lower portion of said shuttle track, the lower edge of said reed being so shaped as to be adapted to effect beating up on movement of the reed as aforesaid.

9. A loom comprising a shuttle track, a reed rearwardly curved in vertical cross-section, arms extending forwards from the top of said reed, pivots for said arms located above said shuttle track, means to move said reed about said pivots to swing it bodily around the lower part of said shuttle track and a part of said reed at the lower edge thereof so shaped as to be adapted to effect beating up when the reed is so moved.

10. A loom comprising a shuttle track and a rearwardly curved reed pivotally mounted adjacent to but forward of its upper edge the said reed having a part of its lower edge shaped to effect beating up, the curvature and location of the reed being such that when the reed is in the beat-up position its lower end is forward of the shuttle track which then lies within the space between the reed and a plane passing through the upper and lower ends of the reed.

11. A loom comprising a shuttle track, a reed which in cross-section is an approximately circular arc, concave side forwards, pivots for said reed approximately at the centre of the said arc immediately above said shuttle track and means to move said reed about said pivots, the lower end of said reed being so shaped as to be adapted to effect beating up.

12. A loom comprising a shuttle track, a reed having a rearwardly curved shape between its upper and lower ends and at its lower end a face with a forwardly projecting part to serve for beating up, pivots for said reed located approxi-

mately at the centre of the said arc immediately above said shuttle track and means to move said reed about said pivots.

13. A loom as claimed in claim 8 in which the shuttle track specified comprises a support extending across the loom from side to side and free from attachment to fixed portions of the loom intermediate its ends or to the reed, and stationary, claw-like members supported from above from the said support and so shaped as to pass to opposite sides of and engage a shuttle while in flight.

14. A loom as claimed in claim 9 in which the shuttle track specified comprises a support extending across the loom from side to side and free from attachment to fixed portions of the loom intermediate its ends or to the reed, and stationary, claw-like members supported from above from the said support and so shaped as to pass to opposite sides of and engage a shuttle while in flight.

15. A loom as claimed in claim 11 in which the shuttle track specified comprises a support extending across the loom from side to side and free from attachment to fixed portions of the loom intermediate its ends or to the reed, and stationary, claw-like members supported from above from the said support and so shaped as to pass to opposite sides of and engage a shuttle while in flight.

16. A loom as claimed in claim 9 in which the shuttle track specified comprises a support extending across the loom from said to side and free from attachment to fixed portions of the loom intermediate its ends or to the reed, and stationary, claw-like members carried from the said support above the track and so shaped as to pass to opposite sides of and engage a shuttle while in flight, and in which the pivots for the reed are mounted upon said shuttle track support.

17. A loom as claimed in claim 11 in which the shuttle track specified comprises a support extending across the loom from side to side and free from attachment to fixed portions of the loom intermediate its ends or to the reed, and stationary, claw-like members carried from the said support above the track and so shaped as to pass to opposite sides of and engage a shuttle while in flight, and in which the pivots for the reed are mounted upon said shuttle track support.

18. A loom as claimed in claim 8 in which there are temples for the selvedges of the cloth, and means actuated by the arrival of the reed at its beat up position to raise said temples.

19. In a loom, a reed of curved form in vertical cross-section, concave side forwards, having a forwardly projecting part at its lower end to effect beat-up, a stationary shuttle track in the concavity of said reed, and means to move said reed around the lower side of said shuttle-track.

20. A loom comprising a shuttle track, a reed rearwardly curved in vertical section partially surrounding said shuttle track, pivots for the upper end of said reed located above said shuttle track, means for movement of said reed about said pivots secured to said reed below the level of said shuttle track and below the level of the lowest part of the curved portion of said reed, the said shuttle track comprising a support extending across the loom from side to side and free from attachment to fixed portions of the loom intermediate its ends or to the reed, and stationary, claw-like members supported from above from the said support and so shaped as to pass to opposite sides of and engage a shuttle while in flight.

OLIVER SHIMWELL.